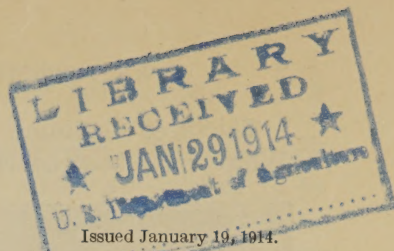


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United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY.

Corn Investigations.

WASHINGTON, D. C.

CORN VARIETIES FOR DISTRIBUTION IN TEXAS, OKLAHOMA, AND LOUISIANA.

INTRODUCTION.

During the course of investigations conducted in Texas by the Office of Corn Investigations there have been developed five new strains of corn. These investigations have been conducted at San Antonio, Waco, Marshall, and McKinney. All these points are located in Texas, but the conditions found at some of them are representative of conditions in southern Oklahoma and in Louisiana.

Because of the productivity and other desirable characters of these varieties, they have been tested extensively in Texas, in southern Oklahoma, and in northern, central, and southern Louisiana. In addition to this, the varieties have been tested cooperatively by farmers at nearly 200 localities in Texas, 20 or more places in Louisiana, and 10 or more points in southern Oklahoma.

The results of these tests indicate that the varieties possess more than average productive ability, and in general they have been superior to those commonly grown in this region. A distribution of seed of these varieties will be of more value if accompanied with information regarding them. This circular is designed for that purpose, and a copy will be inclosed in each package of seed.

METHODS OF BREEDING.

Two of the varieties, Selection No. 136 and Selection No. 170, have been bred by a method of strain selection. The term "strain selection" is used in the sense of breeding within the strain by the ear-to-row method, interbreeding with other strains or varieties being prevented. Progeny of the highest yielding mother ears are selected and planted each year. Detasseling is practiced and seed taken only from detasseled stalks, thus insuring seed that has not been self-fertilized. Only ears of the desired type and from the desired type of stalk are selected for seed.

The three remaining varieties, Cross No. 165, Old Glory, and Brazos White, have been developed in the course of investigations in cross-breeding varieties. Since the crossing of the original varieties the breeding has been maintained within the strain by ear-to-row methods of selection.

U. S. SELECTION NO. 136.

Selection No. 136 is a strain of the Laguna variety. The original seed from which this strain has been developed was obtained from Mexico in 1904. In 1906 an isolated breeding plat was planted near Waco, Tex., and since that time the variety has been bred by the ear-to-row method in the same neighborhood and in the vicinity of San Antonio, Tex.

The variety is adaptable to a wide range of conditions and has proved very productive in many environments. It is excellent for central and southern Texas and one of the most productive varieties for the Gulf coast and the Rio Grande Valley sections of Texas. Types of this variety are not uncommon and are well liked in the western and Panhandle sections.

For two weeks or more after germination the plant makes a slow growth and has a weak, recumbent appearance; later it grows rapidly, making a sturdy, vigorous, dark-green stalk at tasseling time. The height of the stalks usually ranges

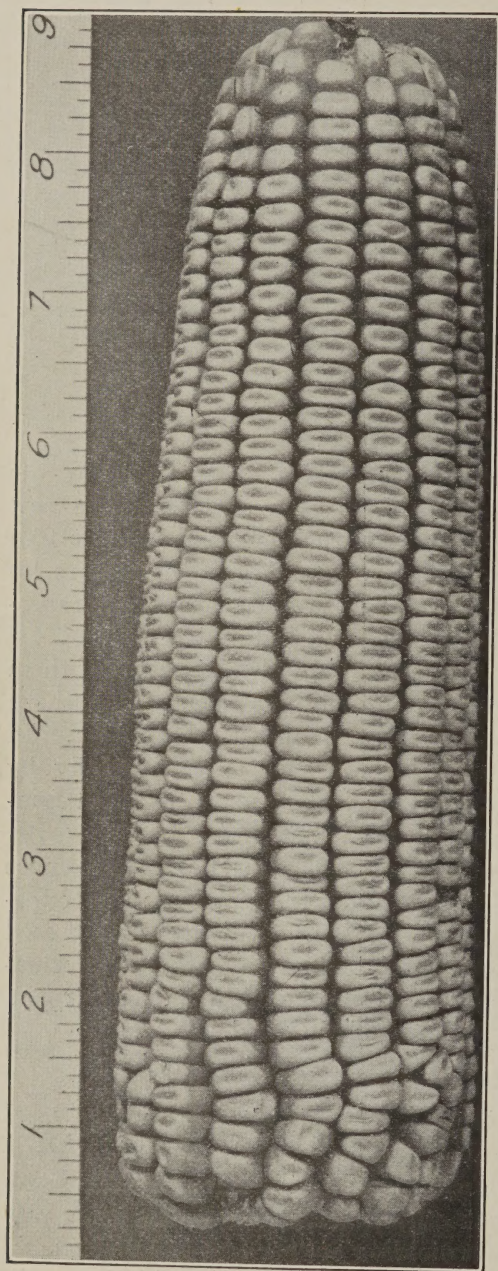


FIG. 1.—Ear of U. S. Selection No. 136.

from $7\frac{1}{2}$ to 9 feet where planting has been made early. When planted late, in May or June, the stalks frequently attain a height of 12 to 13 feet. The stalks are large in circumference; the lower or basal portion has a somewhat broadened or flattened appearance; foliage abundant, 14 to 16 blades, very dark green, giving a vigorous appearance to the plant; usually the variety makes few suckers, the number being greater when the planting is made on very fertile land and when moisture conditions are favorable.

The Laguna should be classed as a single-eared variety, but the number of ears varies from one to three, two to the stalk being frequently found. The root system is well developed and more extensive than that of most varieties that have been under observation. The husks are very heavy, thick, and coarse in texture, and are closely wrapped about the ear, affording a degree of protection against insect damage. The ears are $7\frac{1}{2}$ to 9 inches in length, 7 to 8 inches in circumference, with 16 to 18 rows of kernels ranging from 50 to 55 kernels to the row. The ears usually have the white, glossy, smooth appearance characteristic of many of the Mexican varieties of corn, with slight indentations in the crowns of the kernels. A considerable number, however, are very similar to the ordinary dent type of corn. The cob is white, of medium size, and very light in weight. The variety shells

out 83 per cent of grain. The length of the growing season is 125 to 130 days. A typical ear and stalks are illustrated in figures 1 and 2.



FIG. 2.—Stalks of U. S. Selection No. 136.

U. S. SELECTION NO. 170.

The strain known as U. S. Selection No. 170 has been developed from the Schieberle White Dent variety. The selection was started in 1909 upon a farm near Marshall, Tex., and has been continued upon the same farm. The variety from which this strain has been bred was the result of a cross of the Gourd seed and dent types. Strain No. 170 has been bred to a dept type, though to some extent it

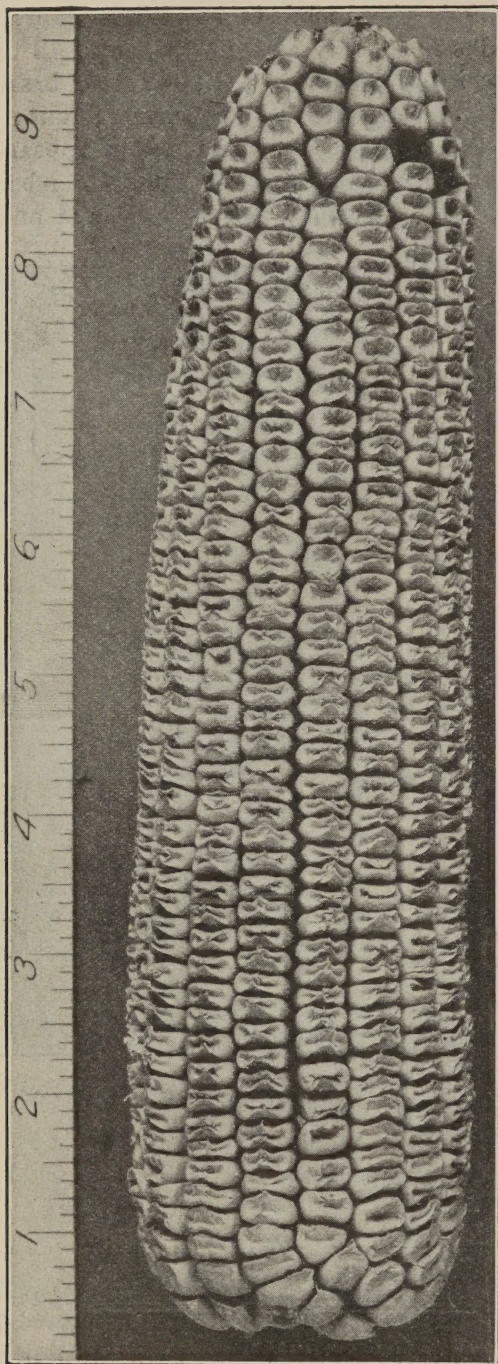


FIG. 3.—Ear of U. S. Selection No. 170.

shows an intermediacy between the Gourd Seed and the dent. Reversions to the short, stubby Gourd Seed type of ear occasionally occur. The stalk grows rapidly and vigorously, usually attaining under fair conditions of cultivation a height of $9\frac{1}{2}$ to 11 feet. Under conditions more favorable to stalk growth these heights will be exceeded.

The stalk is large in circumference, giving it a somewhat stocky appearance despite its height; the foliage is abundant and the blades are long and broad, making the variety especially good for forage purposes where desired. Comparatively few suckers are formed. The variety usually bears one ear to the stalk, though two ears are of frequent occurrence. The root system is well developed and extensive, but does not differ materially from other similar varieties of corn.

The husks are heavy and closely wrapped about the ear, affording protection against insect injuries. The ears are mostly of a rough type, $8\frac{1}{2}$ to 9 inches in length, 7 to 8 inches in circumference, with 16 to 20 rows having 50 to 55 kernels to the row. The

cobs are white, with an occasional red one, and are medium in size in proportion to the ear and somewhat hard in composition. The grain

is deep, and the variety shells out 82 to 84 per cent of grain. The length of the growing season required is 125 to 130 days. Selection No. 170 has been a frequent winner at fairs and corn shows, where it has been exhibited as the Meyer corn. A typical ear and stalks are illustrated in figures 3 and 4.

U. S. CROSS NO. 165.

The variety known as U. S. Cross No. 165 is the result of a combination of McCullough No. 20, Ferguson Yellow Dent, and a somewhat earlier maturing Kansas variety, Hildreth Yellow Dent.

The crossing was made in 1908 on a farm near Marshall, Tex. Since then the cross has been bred upon the same farm by the ear-to-row method. In a number of tests this cross has proved to be a good variety, ranking among the most productive and making ears of good quality and appearance. Under average conditions the stalk grows $7\frac{1}{2}$ to 9 feet in height, is vigorous in growth, has a slightly flattened appearance at its base, abundant foliage, few suckers, and a good root system, although not so large and extensive as that of Selection No. 136. It should be classed as a single-eared variety, although two-eared stalks frequently occur, the number of ears per stalk being controlled to some extent by the fertility of the soil and the planting space.

The ears are 8 to 10 inches in length and 7 to $7\frac{1}{2}$ inches in circumference, with from 16 to 18 rows of 50 to 55 kernels to the row. The ears are slightly rough in appearance for the most part, but



FIG. 4.—Stalks of U. S. Selection No. 170.

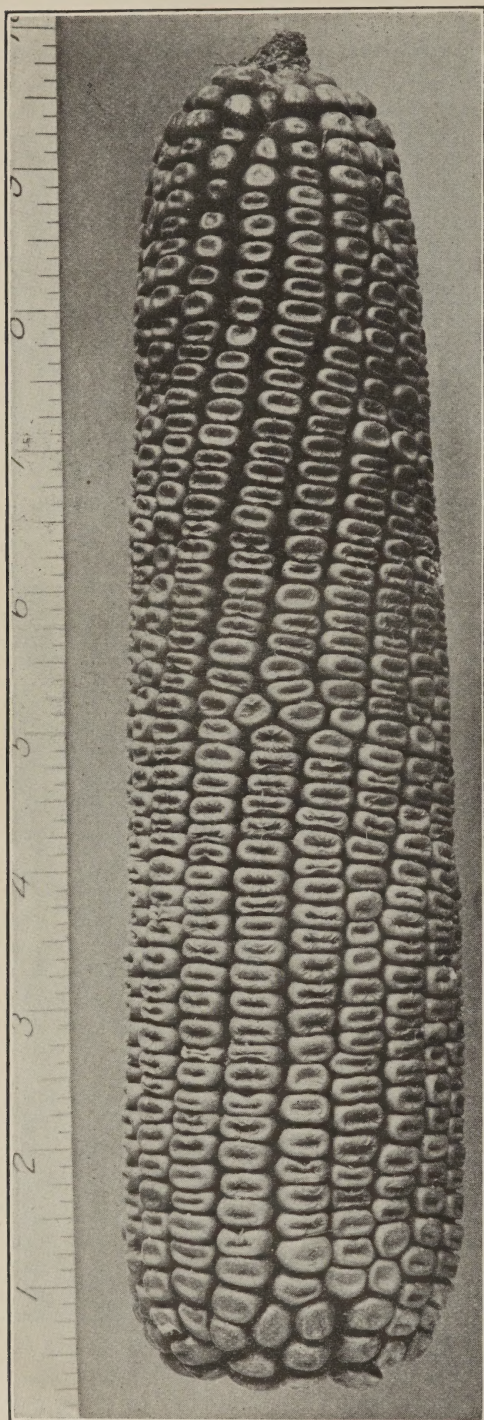


FIG. 5.—Ear of U. S. Cross No. 165.

there is a considerable variability in this respect and also in the shape of grains (two comparatively unimportant points so far as yields are concerned). The grain is a deep, rich yellow in color; the cobs are red, of medium size, and usually of light composition. The variety shells out 83 to 84 per cent of grain. The growing season required is about 120 days. This variety has been a frequent prize winner at State and local corn shows, where it has been exhibited under the name of Anderson Yellow Dent. A typical ear and stalks are illustrated in figures 5 and 6.

OLD GLORY.

The Old Glory variety is the result of a cross between the Gorham Yellow Dent variety and Selection No. 136 (Laguna). The cross was made in 1909 on a farm near Waco, Tex., and was named by the farmer cooperating with the Office of Corn Investigations. Since that time it has been bred upon the same farm by the ear-to-row method. The Old Glory has been productive in variety tests and has outyielded the parent varieties.

This variety is a strong, vigorous grower, having a large root system, a heavy, well-developed tassel, and

abundant foliage. The stalk and husk resemble those of the Laguna variety. The Old Glory produces few suckers under ordinary conditions. The stalks are usually 8 to 9 feet tall, but when planted late in the season or where an abundance of moisture is available these heights will be exceeded. The variety should be classed as a single-eared type, although two ears to the stalk are not uncommon.

The ears are 8 to 9 inches in length, 7 to 7½ inches in circumference, with 16 to 18 rows having 50 to 55 kernels to the row. The ears range from rough to smooth types, some having the glossy appearance frequently seen in the Laguna variety, but for the most part they are intermediate between the two parent varieties.

The selection has been directed toward a white-capped yellow-dent type; that is, kernels having a white, starchy crown, with the body or lower portion of the kernel yellow. This is a difficult character to "fix," and there is still a large amount of variability in the coloration of the grain. The proportion of the white-capped type, however, has been increased each year. The cobs are of medium size in proportion to the size of the ear, of light composition, and both red and white in color. The variety shells out 84 per cent of grain. The length of the growing season required is 125 to 130 days. This variety is not sufficiently uniform to be valuable for show purposes, but when tested with other varieties for productiveness it has ranked among the highest. Figure 7 illustrates a typical ear.

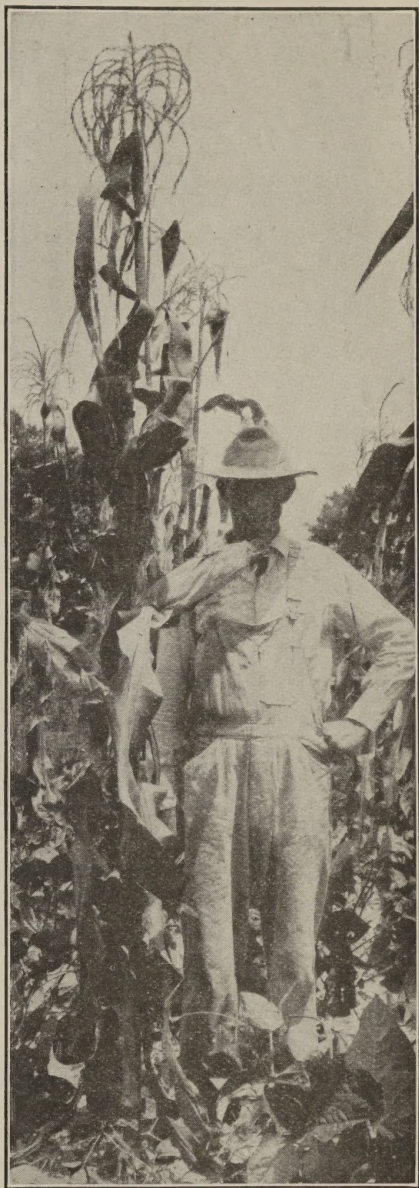


FIG. 6.—Stalks of U. S. Cross No. 165.

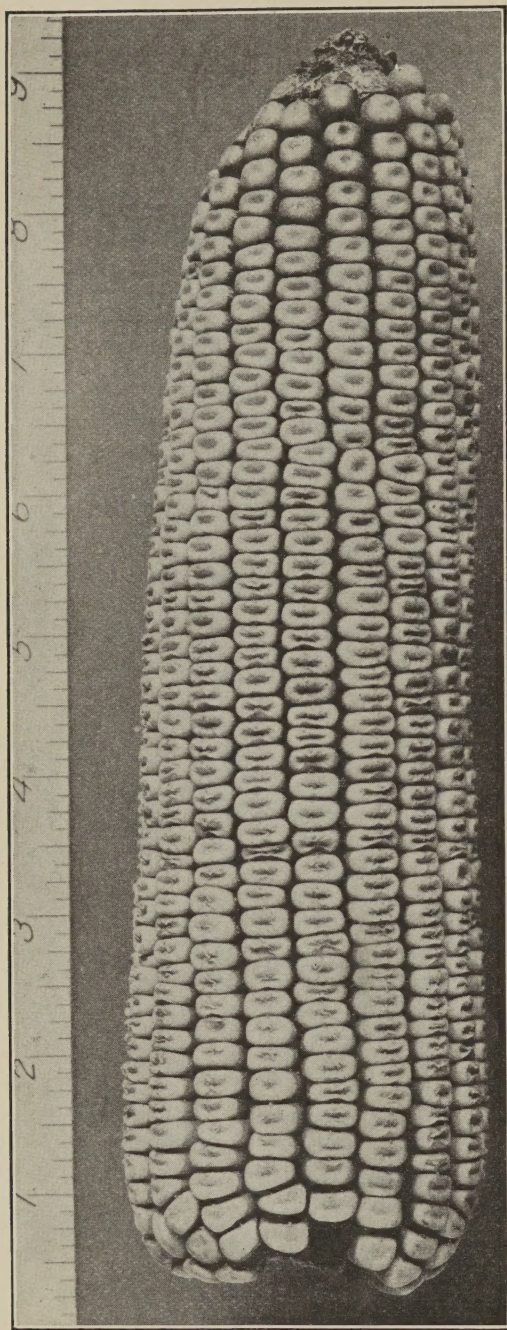


FIG. 7.—Ear of the Old Glory variety.

is more like that of the Boone County White. The variety produces one or two ears per stalk, more frequently one. The ears are 7 to $8\frac{1}{2}$ inches in length and 6 to $6\frac{1}{2}$ inches in circumference, having

BRAZOS WHITE.

The Brazos White has resulted from crossing Selection No. 137, a strain of Boone County White, with Selection No. 136 (Laguna). The cross was made on a farm near Waco, Tex., in 1909, and since that date has been grown in the same locality and bred by the ear-to-row method.

The cross is intermediate between the two parent varieties in the type of the stalk growth and in the length of the growing season required. The type of ear is also intermediate. The kernels resemble those of the Laguna variety in composition, but their shape and arrangement upon the ear resemble more the Boone County White variety. The stalks are less robust than in the Laguna variety, and the foliage is less abundant and not so tropical in appearance.

With early planting and average conditions of fertility and moisture the stalks rarely exceed 8 to $8\frac{1}{2}$ feet in height and produce few suckers. The husk is much lighter than in the Laguna variety and

16 rows with 45 to 50 kernels to the row. The cobs are white in color and of medium size. The variety shells out 81 to 82 per cent of grain. The growing season required is about 115 days. A typical ear and stalks are illustrated in figures 8 and 9.

USE SEED OF ADAPTED VARIETIES.

The varieties described have been found by tests to be good productive varieties in the corn-growing section of Texas, southern Oklahoma, and Louisiana. The results secured are such as to warrant a distribution of the seed in those States. In many localities the seed should prove to be a good foundation stock for breeding strains of more local adaptation and for crossbreeding with other varieties.

The growing of a variety unadapted to or unable to adjust itself to a new environment usually results in loss to the grower because of inferior yields or quality. Losses of this nature are not uncommon in Texas, Oklahoma, and Louisiana, though probably more frequent in Texas than in Oklahoma or Louisiana. An instance of this kind is illustrated in figures 10 and 11. The two fields shown adjoin each other. The conditions represented are essentially the

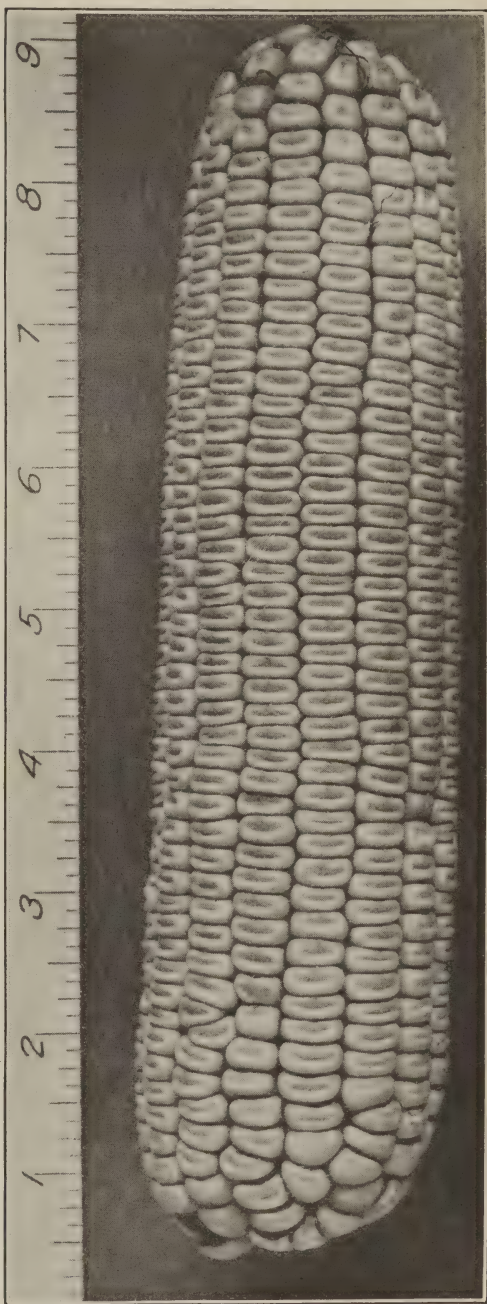


FIG. 8.—Ear of the Brazos White variety.

same as to soil, farming methods, previous cropping, and fertilization. The significant difference is that one field (fig. 10) is planted

with a very early-maturing variety totally unadapted to its environment, while the other field (fig. 11) is planted with a locally bred variety adapted to its environment. The unadapted variety made



FIG. 9.—Stalks of the Brazos White variety.

practically no grain yield; the adapted variety yielded 30 bushels per acre.

The degree to which a variety is unadapted may vary greatly. In some instances the lack of adaptation may result in as great or



FIG. 10.—A variety unadapted to its environment. The plants are weak and lacking in vigor and the ears altogether absent or very poorly developed. Contrast with figure 11.



FIG. 11.—A variety adapted to its environment. Healthy vigorous plants having large, well-developed ears. Contrast with figure 10.

greater losses than in the case just cited; in other instances the loss may be negligible. Unusual seasonal conditions may be so advantageous to ordinarily unadapted varieties that they will outyield local and adapted varieties.

Varieties that would be considered unadapted are sometimes grown because of some characteristic they possess, such as early maturity, short stalk growth, or some other valuable quality. These varieties under normal conditions do not yield and are not expected to yield as heavily as the later maturing adapted varieties, but they supply a need for feed, which frequently arises before the late-maturing varieties are sufficiently mature. As loss may be sustained in growing unknown varieties because they may not be adapted, it is advisable before attempting to grow them on a field basis to test them upon a small scale.

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Approved:

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Chief of Bureau.

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